

Colorado Department of Health  
Hazardous Materials & Waste Management Division

Comments

on

DRAFT

PHASE I

RFI/RI WORK PLAN

FOR

ROCKY FLATS PLANT

700 AREA

Operable Unit NO. 8

May, 1992

as supplemented on

JUNE 22, 1992

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General Comments:

- 1) The Phase I RFI/RI Workplan for OU 10 is the first workplan to be finalized in which an investigation of varied IHSSs within the industrialized portions of the plant is presented. While it is not necessary for the OU 8 Workplan to be identical to the workplan for OU 10, please refer to the final version for guidance. There were lengthy sets of comments and long discussions that set many ground rules for investigations in the industrialized portions of the plant and there should be no reason to re-invent the same concepts. Any presentation technique in the OU 10 Workplan that would enhance the clarity and/or brevity of this workplan should be incorporated.
- 2) The Division has noted many inconsistencies in the industrial area OUs with regard to soil sampling. Please refer to our letter of 9/1/92 (Gary Baughman to Frazer Lockhart) which outlines how we think these inconsistencies can be overcome.
- 3) Portions of some of the OU 8 IHSSs lie beneath buildings. Since these portions of the IHSSs cannot be investigated and

evaluated, they will need to be monitored until the buildings are removed. Specifically, this means that a sufficient number of ground water monitoring wells will need to be installed to determine if any contaminated water migrates out of the unit. While monitoring of this type is not within the scope of the RFI/RI investigation, determination of the extent and location of any present or past release from the unit is within the investigation scope. Therefore, we urge DOE to consider how the FSP could be modified since the logistical implementation necessary to satisfy both of these concerns could be the same (i.e., installation of wells).

4) The Field Sampling Plan should contain sub-sections that describe the rationale of each sampling strategy and preferred methodology specific to the conditions and expected contaminants of each IHSS. Not only should the work plan give instructions to the individuals who will ultimately implement the plan, as Table 6.1 attempts to do, but it also must demonstrate to the Division and EPA that the plan represents a sound design.

5) Although some issues remain that may need to be addressed in the HRR quarterly updates, the HRR is final and approved. DOE should consider which PACs may be logically and efficiently incorporated into this work plan versus their inclusion into potentially new operable units. (The Division, as specified in Section I.B. 5 of the IAG Statement of Work (SOW), will review the HRR to determine whether DOE will be required to initiate new RFI/RIs or amend existing RFI/RI Work Plans as specified by IAG, SOW, Section VI.A.)

6) Footing drains of building were raised as a large issue during scoping meetings but are for all practical purposes ignored in the FSP. DOE must revisit the FSP in regard to footing drains and determine if sampling of these structures is appropriate in determining the nature and extent of contamination.

#### Specific Comments:

Table of Contents: A List of Acronyms should be added to this work plan.

Section 1.6.1: At the top of page 1-8 the statement is made that Figure 1-3 locates "... the 38 IHSSs for which Phase I RFI/RI activities are planned...." Please revise the text here, and elsewhere as needed, to reflect the reduction to 24 IHSSs under this work plan.

Section 1.6.7.3: The statement under "Hydraulic Conductivities", page 1-29, regarding the conclusion that hydrostratigraphic units "...are not generally believed to be capable of producing amounts of water of economic significance...." is inappropriate and must be amended. While the aquifers may not produce salable water it is yet to be determined if quantities are sufficient to support

"beneficial use" as the term is applied by the State Engineer's Office. Additionally, contamination of alluvial water that may transmit contaminants to other surface or groundwater resources may not be dismissed.

Section 2.3.1: Regarding the first reference of this section, first paragraph, there is no EG&G, 1990e reference listed in Section 11.0. Please either correct the citation or amend Section 11.0.

Reference is made to Figure 1-3 in this and subsequent sections. It would be better to include this figure, redundantly if necessary, with the Section 2 figures. Also, any buildings referenced in the text (e.g Building 701) should to identified on the Figure.

In the Division's Notice of Violation No. 92-05-22-01 concern over changes to IHSS configurations and locations, and impacts on the appropriateness of proposed sampling locations, was raised. DOE management, during the June 17, 1992 OU-8 Dispute Resolution Meeting, expressed the belief that the OU-8 IHSSs as of May 1992 reflected the Final HRR. The Division reiterated its observation that IHSS locations and configurations were not in conformity with the Final HRR. The Division acknowledged the value of updated information but further explained the need to arrive at reasonably established locations to provide confidence in the Field Sampling Plan (FSP). However, the Division now observes that the size of IHSS 118.1 has been reduced, since the May submittal, to more closely conform to the size of a tank upon which this IHSS is based. This appears to be an inappropriate reduction. The historical information, Section 2.4.1.1, states that tank overflows were flushed "with large volumes of water" and that carbon tetrachloride from the tank's sump pit was "pumped out of the pit onto the ground. The Division doubts that large volumes of water were confined to either a 30 x 13 or 20 x 40 foot area. As a stage of effort, DOE must determine the probable surface flow direction, the impacts of any under drains on the extent and direction of the release, and establish a FSP that is capable of determining the nature and extent of contamination within the IAG schedule.

Although the Division generally agrees with the repositioning of IHSS 118.1 based upon findings of the Historical Release Report, as amended for this work plan, DOE must show the location of Building 730 on Figures 2-7, 6-2 and 6-8. It will then be clearer why IHSS 118.1 is proposed at its new location.

Section 2.3.2: In the second paragraph of this section, IHSS 118.2 is reported to be an organic solvent tank inside Building 776; however, based on information in the Historical Release Report (HRR) the IHSS has been reduced in size and location, such that it is no longer physically associated with Building 776. Later, Section 2.4.1.2 states that "one of the tanks ruptured and leaked

solvent onto the ground". It is unclear whether this is the organic solvent tank in Building 776 that constitutes IHSS 118.2. Much later, in Section 2.5.3.3.1, the Division is informed that the above-ground carbon tetrachloride tank, north of Building 707, is the primary source of contamination. However, two paragraphs later, the Division is informed that the organic solvent tank in Building 776 "is described" as the primary source. These inconsistent, segmented and vague historical descriptions demonstrate the lack of a basic understanding of the IHSS, the inability to express an understanding, the inability to determine what constitutes the IHSS, or whether two sites need to be investigated. DOE must resolve these types of deficiencies to provide a clear discussion of this and other IHSSs. Only then can the Division determine the adequacy of the FSP.

Section 2.3.3: Either this section or Section 2.5.3.1.1 needs to contain a more complete description of expected or potential contaminants resulting from the release of process waters. The Division presumes that radionuclides may be a contaminant; are non-radioactive metals and solvents potential contaminants? For each IHSS, DOE must consistently use process knowledge to describe potential contaminants rather than merely referring to the vehicles, e.g. process waters or laundry water.

Section 2.3.4: Building 373 is referenced in the second paragraph of this section; consequently, it should be included on Figures 6-2 and 6-3. From the HRR the Division assumes that Building 373 is contiguous with Building 374 but requests that DOE verify this assumption. The Division needs to see the geographical relationships of the cooling tower and the pond.

Section 2.3.5: The reference in the first paragraph of this section appears to be to Figure 2-1 not 3-1. Also, Buildings 712 and 713 need to be labeled on Figure 6-8.

Since the Building 776 cooling towers are Buildings 712 and 713, it would be less confusing to continue to refer to the towers.

Section 2.3.6: Building 779 must be shown on Figure 2-1, 6-3 and 6-6.

Section 2.3.8: Better justification of the relocation of IHSS 139.2 must be provided. Appendix B and the Appendix B Supplement are inadequate. The distance from the original to the new site, 350 feet south and 250 west, raises concern that two sites are possible and that each may warrant investigation. The Appendix B discussion of IHSS 139.2 only briefly discusses the hydrofluoric acid supply area before turning full attention to the nitric acid dumpster. The Division wishes to know the basis for the location change of IHSS 139.2; the discussion of the nitric acid dumpster not only clouds the discussion of the HF supply area but is also tangential. Please verify and justify the location change.

It is also unclear, as described in Section 2.3.8 or Table 6.1, whether the IHSS 139.2 configuration includes the nitric acid area for the purpose of investigation.

Section 2.3.9: A clean-out plug overflow is briefly discussed in the first paragraph of this section. Further information is necessary on this overflow to ensure that the release is included in the investigation and that the investigation is adequate.

Show Building 730 on Figures 6-2 and 6-8, etc.

Please specify that 144(S) is the original IAG IHSS location and that 144(N), assuming this is correct, includes the Tank and Building 701/770 leaks.

The second and third paragraph of this section represents the commingling of subjects and facts evident throughout many of the previously described IHSSs. To discuss Tanks 776A-D then to jump to the alley way between Building 777 and 779, then back to the tanks, is very difficult to follow. Please reorganize this section to discuss each segment of the IHSS sequentially.

Other than radionuclides, what potential contaminants from laundry waste waters are under consideration, metals, solvents? What types of contaminants were potentially contained in the process waters from Tanks 776 C&D?

Regarding the last paragraph, page 2-13, how does the floor drain relate to this IHSS? Please clarify.

Section 2.3.10: The dimensions of this IHSS are inconsistent with the intent of extending the boundary 120 feet east. The HRR dimensions are less than those reported by EG&G (1990c) as shown on the IAG IHSS map. Clearly, the eastward extension from Building 770, per Figure 6-4, is IHSS 172.

The last sentence, third paragraph, page 2-15 is superfluous and should be deleted from the work plan.

Section 2.3.11: Once again, the long dimensions of the IHSS do not appear consistent. An expansion of 245 feet from 250 feet does not equal 600 feet. As shown on Figure 6-2, the IHSS is approximately 680 feet long. Please reconcile these differences and discuss them in a clear manner.

Section 2.3.13: Regarding the last paragraph, page 2-18, it is stated that the preceding section on IHSS 150.2 discussed the May 1969 fire. There is no such discussion in Section 2.3.11. Please discuss and reference the fire as appropriate.

Section 2.3.16: Figures 1-3, 6-2 and 6-9 do not show the courtyard corresponding to IHSS 150.7. This court yard must be shown.

Also, with the courtyards isolated by enclosed hallways, how will the borings and HPGe surveys, etc., as proposed in Table 6.1, be accomplished?

Section 2.3.23: Building 992 is referenced in this section and thus needs to be shown on Figures 6-2 and 6-12.

Section 2.4: The Background Geochemical Characterization Report is being revised; it should be stated that current comparisons to the report are preliminary.

DOE's continual reference, in this and subsequent sections, to constituents being in excess of upper tolerance limits but less than maximum background concentration is inappropriate. Although a single exceedance of tolerance may be viewed as an anomaly, as would some background values, the concentration could also be indicative of contamination. It is noteworthy how often DOE has reported exceedance of tolerance in the subsequent sections; is it hoped that all such exceedances will be mere anomalies? As more sampling is done, it could well be that additional exceedance of background tolerance will occur. This would be additional indication of contamination. Please remove comparisons to maximum background values or acknowledge that exceedance of tolerance limits may be indicative of contamination.

Section 2.4.1.1: Is there any information available to indicate whether the spill flowed to the sump or flowed onto the ground? If not, indicate if possible the most likely dispersal of the solvent, i.e. to the ground, the sump, or under drains.

Section 2.4.1.2: Please specify the tank that ruptured and where it is, or was, located. Is it in Building 776?

Table 6.1 for IHSS 118.2 states that Americium 241 was added as an analyte of interest; however, there is no discussion here or elsewhere in Section 2 of this contaminant. Please add.

Section 2.4.1.3: Unless the pipeline's integrity can be demonstrated, or is covered under another OU, it is inappropriate to exclude the pipeline from the investigation.

Section 2.4.1.6: Please locate collection trench number six on Figure 6-8.

Regarding the last paragraph, page 2-44, please locate Building 783 on Figure 6-8 and specify whether the spill is covered by a Potential Area of Concern (PAC) or is covered under IHSS 138.

Section 2.4.1.9: In the second paragraph of this section, please specify the types of potential contaminants, i.e. volatiles, metals, radionuclides, etc.

In the second paragraph, page 2-54, the ground east of building 701 is reported to be contaminated. Does the IHSS 144(N) boundary encompass the contaminated ground or is it merely the site of the tanks? The contaminated ground, and the clean-out plug, must be investigated.

Building 730 corresponds to the locations of the four underground tanks and should be shown on Figure 6-8.

Section 2.4.1.10: Regarding the last paragraph, page 2-62, attention is again called to inconsistencies in the IHSS dimensions.

Section 2.4.1.12: How deep is, or was, the Process Waste Line? This knowledge would provide important direction to the FSP.

Section 2.4.1.16: There is no clear indication that IHSS 150.7 encompasses potential airborne contamination to the west-southwest. DOE must ensure that this release area is properly investigated.

Section 2.4.1.21: A recommendation is made in the second paragraph, page 2-80, that portions of the roadway, where asphalt was previously removed, be excluded from this investigation. The Division, at present, does not concur with exclusions, nor does the FSP reflect any exclusions. Table 6.1, in fact, specifies that soil samples be collected. It is unclear whether these soil samples would be collected from unpaved areas of the road (if such exist), from beneath the pavement, or from soils adjacent to the roadway. Collection of soil samples beneath or adjacent to paved portions of the roadway would indicate that removal of asphalt is not a good cause for an exclusion. If DOE can provide a better rationale for an exclusion; the Division will consider the request.

Section 2.5: Reference is made in this Section to Figures 2.5-1 through 2.5-5. It is awkward having these figures based upon the section number. Please change Figure 2.5-1 to Figure 2-8 and Figure 2.5-2 to Figure 2-9, etc.

Section 2.5.3.1.1: In the last sentence of page 2-99, please indicate that the primary release mechanisms at this IHSS are believed to be overflow, leakage and pumping onto the ground. This addition is important in that pumped liquid may have been of a greater volume, may have affected a greater area, and may have flowed in a different direction than overflows or leaks. Furthermore the FSP must recognize this greater potential for the spread of contamination and the need to devise a complete investigation.

This section does not always, nor adequately, discuss the contaminants of principal concern. For example, IHSSs 135, 137 and 138 express concern about blowdown water but not specifically hexavalent chromium, as it should. Please revise Sections 2.3 and

2.5.3.1.1 and consistently and completely discuss the contaminants of potential concern that the FSP needs to target.

Section 2.5.3.3.1: The discussion of IHSS 118.2 is also insufficient; carbon tetrachloride is discussed in Section 2.3 along with other organics but discussion of the "other organics" is missing from this section.

Table 2.1: The footnote reference on the second page of the table should read "Historical Release Report".

Table 2.2: This table should be retitled "Listing of Non OU-8 IHSSs, PACs and UBCs Located within the OU-8 Boundary, etc". The current title can be misinterpreted to mean that the units are part of OU-8.

Figure 2-1: The Building 730 Tanks are relative to PAC 700-132 but appears, on this figure, to be related to PAC 700-1007. Please revise the map.

Figure 2.5-2: The conceptual model flow chart presented here is not sufficient to determine whether the proposed FSP is adequate to provide data on each pathway for the Baseline Risk Assessment and Environmental Evaluation. DOE must ensure that each pathway is covered by the sampling. Attached is a General Conceptual Model that may be helpful in redeveloping the flowchart. Please note that additional primary and secondary release mechanisms are shown on the example. DOE need not, and should not, incorporate this example into the work plan verbatim, but should fully consider all possible and complete pathways.

Section 3.0: Please refer to the Division's letter of June 12, 1992 on Chemical-Specific Benchmarks Tables (re: Gary Baughman, CDH to Martin Hestmark, EPA with copy to Rich Schassburger, DOE). Attachment A of the letter provides our guidance on the key points of benchmarks to establish detection limits and ARARs to establish cleanup standards. Please verify that the current Section 3.0 contains the latest update of the tables as requested in the subject correspondence.

Section 5.1.1.2: The Colorado Department of Health, Water Quality Control Division notes that contaminants believed to have been released from certain IHSSs were not always included in the analyte lists of existing wells. In a latter substage of this RFI/RI, DOE should consider using suitably located wells, despite their scarcity, as additional data sources by expanding the analyte lists.

Section 5.2.1.1: The Water Quality Control Division should be identified as a data user.



Section 5.2.1.3: The Division agrees with the use of the conceptual models as expressed in the last paragraph of this section. Thus, our comment on the insufficiency of the flowchart, Figure 2.5-2.

Section 5.2.2.5: In the first paragraph, page 5-17, Environmental Management Division Manual 5-21000, Volume III, Geotechnical, is referenced. In Section 6.3 Standard Operating Procedures (SOPs) are discussed. Although the former reference is the most precise, some confusion could be eliminated by indicating that this manual is a group of SOPs. Perhaps both sections should be amended for better continuity.

Please note the slight error in the second and fourth paragraphs of page 5-18, 521000 versus the correct form 5-21000.

Table 5.8: The grid spacings of IHSSs 150.3, 150.4 and 150.6, i.e. 2 rows of 3 boreholes, etc. does not correspond to 7 boreholes, etc. nor to the corresponding figures of Section 6.0. Perhaps stating the grid as a nominal 25 x 75 foot, etc. would be less confusing. IHSS 150.6, Figure 6-6, certainly is poorly described as 2 rows by 4 boreholes.

#### Section 6.0:

##### General Comments:

- 1) The Division views the lack of IHSS specific subsections as a serious omission. DOE must relate potential contaminants of concern and affected media to rationales for the proposed FSP activities. Merely stating activities in Table 6.1 does not adequately support the FSP. The DQOs of Section 5.2.2.5 are good, but too general.
- 2) With some exceptions, specific Standard Operating Procedures (SOPs) are not referenced.
- 3) Clearly, in light of the Historical Release Report (HRR) alterations of IHSS boundaries and locations, Table 5 of the IAG Statement of Work should be amended. DOE has not taken advantage of the proposed staged approach to base boring locations upon initial results.
- 4) DOE appears to have violated its own sub-staging protocols. For example with some IHSSs, borings are a logical Sub-Stage 2 activity that cannot benefit from and should not be delayed by the results of Field Surveys or Surface Investigations. Borings, in such circumstances, should be in Sub-Stage 2. The Division acknowledges that mobilization of drilling equipment may add cost to the program; however, any additional costs must be weighed against program delays. Perhaps drilling activities can be coordinated with the needs of other OUs to eliminate the need for

re-mobilization.

Also, those borings that are appropriate to Sub-Stage 4 should not be proposed at this time; the number and locations of these borings should be proposed in Technical Memorandum 1. In essence, Table 5 will be re-scoped at that time.

5) DOE needs to clarify, in this section, that sampling will continue to the edge of any possible contamination anomaly, even if this is past the edge of an IHSS. This is necessary to establish the extent of any contamination.

6) The Division acknowledges the difficulty of determining the grid required to meet a strict statistical objective. However, the Division expects that the data obtained through implementation of the FSP will allow DOE to determine the level of sampling needed to achieve a 95% confidence level. Viewed as a staged approach, the FSP as proposed should support subsequent rounds of sampling within the time frame of the IAG schedules. DOE should prepare a budget which assumes a staged approach.

#### Specific Comments:

##### Section 6.4.1:

Under Sub-Stage 2b, page 6-13, the assumption that "...radionuclide distribution is relatively homogeneous over the field of view, and that the distribution varies only with depth" is not likely to be the norm for this OU and is of major concern. The proposed method will provide one data point, expressed in terms of pCi/g units for each survey point covering a 45 foot circle. This result will purport to represent the average radionuclide concentration over the area. The detector has no capability to determine the distance of a gamma source within the viewed area. Therefore, a hot spot immediately below the detector will result in a larger reported concentration than a hot spot at the edge of the field of view of the detector. DOE must demonstrate the ability of HPGe to both detect and locate hot spots with the proposed grid spacing. The applicability of the Sodium Sampling Probe Radiation Survey to this OU should also be considered.

Substage 2b must be further clarified to state that HPGe necessitated surficial soil and depth profile samples are being collected. These commitments are discussed in the second full paragraph of page 6-14.

Table 2.37 indicates the potential for metals contamination in five IHSSs. Since soil gas surveys and radiation screens are not capable of detecting non-radioactive metals, surficial sampling for metals should be initiated early in the investigation, i.e. during the time frame of Sub-Stage 2 even if DOE considers it to be a Sub-Stage 3 activity.

The Division recently received a SOP for the HPGe; however, protocols for the laboratory HPGe, as discussed in the first paragraph of page 6-15, has not been provided in this SOP. DOE must include laboratory protocols in the HPGe SOP. Also, the use and reliability of a laboratory HPGe has not been demonstrated to the Division; therefore, it is inappropriate to substitute this technique for the standard radiochemistry lab analysis. At a minimum, lab HPGe results will need to be confirmed by a subset of radiochemistry lab analysis or documentation must be submitted that properly demonstrates lab HPGe accuracy and precision based on test results.

Regarding the first paragraph, page 6-15, the statement is made that additional soil samples will be collected at a subset of HPGe survey points. Surficial soil samples must be randomly located to confirm both HPGe negatives and positives. Collecting samples at the HPGe stations does not provide a suitable level of confidence that HPGe results are accurate.

Regarding Sub-Stage 3a -- Surface Scrapings, page 6-17, the Division has previously noted weaknesses in SOP GT.8 and has specified that it be modified (OU-11 comments May 8, 1992); consequently, references to soil sampling techniques must be precise by name and procedure number (e.g. Section 6.3) pending revision of GT.8. Also in keeping with the soil sampling procedures of OU-11, the sampling of unpaved areas should use the meter square template approach and collect five sub-samples at each surficial soil sampling station. Given both the difficulty of access and the decreased potential for disturbance, sampling beneath paved surfaces may be limited to one sample versus five sub-samples. (Please refer to the Division's letter from Gary Baughman to DOE's Frazer Lockhart dated 9/1/92 for a full discussion on soil sampling issues prior to re-writing this FSP.)

Reference to Technical Memorandum (TM) 5 of OU-1 is unacceptable. Sampling crews should not be referred to other work plans or TMs. The procedures described in TM 5 must be incorporated into SOP GT.8 or a SOP Addendum, preferably GT.8.

Neither Table 6.1 nor 6.2 support the depth of collection for surface sampling, as stated in the first paragraph of this section, not even by reference to SOP GT.8. Also, Table 6.2 does not support analytical parameters as stated.

Furthermore, for all samples within the industrialized area of the plant, the Division has adopted the position (9/1/92 letter) that a 5 centimeter sample should be collected for surficial soil samples whether intended for radionuclide or non-radionuclide analysis.

The last sentence beginning on page 6-18 states that shallow soil samples will be collected to meet IAG requirements. Although the

Division views Table 5 of the SOW as minimum requirements, it is recognized that more recent information renders some requirements inappropriate. The Division questions the need for 9 shallow soil samples on a grid for IHSS 139.2 and will consider alternate FSP activities relative to Hydrofluoric and Nitric acid. Sampling in the immediate vicinity of the Hydrofluoric and Nitric Acid containers would be more realistic and appropriate.

Under Sub-Stage 4a, page 6-20, "Soil borings are defined as borings from which soil samples are collected from a depth of six feet or greater." This statement should not imply that the 0-6 foot increment will be excluded from sampling, especially when shallow soil samples are not proposed. For example, residual carbon tetrachloride may be found in the near surface despite its DNAPL properties.

Under Sub-Stage 5b, page 6-24, DOE must ensure that SOPs for vadose monitoring are prepared and submitted prior to or concurrent with the submittal of TM2.

Under Sub-Stage 1c, second paragraph, page 6-27, reference is made to a Phase II RFI effort. The Division has repeatedly stated its opposition to a Phase II except as specified by the IAG. To the fullest extent possible, staging within Phase I should be used to perform a full, complete, and adequate RFI/RI investigation.

Table 6.1:

IHSS 118.1: Under the Proposed Action "Surface/Shallow Soil", it is stated that surface soil samples may be collected. Above background concentrations of certain radionuclide, as described within Section 2, justify the inclusion of surficial soil samples following HPGc to confirm positives and negatives. Samples should be collected now, not possibly later.

Under "Soil Borings/Soil Surface Scrapes" the locations of soil borings are discussed. It is acceptable to discuss borings as a staged activity; however, the locations and number of borings should be specified in the proposed Technical Memorandum #1.

Under "Suggested Modifications to the IAG Plan" the statement is made that soil gas detection limits will depend upon the instrument used. For screening and locating contaminant "hot spots", instrument detection limits may be sufficient; however, nature and extent of contamination will require that analytical capabilities achieve the contaminant levels specified in the Benchmark Tables.

IHSS 132.1: The FSP for this IHSS is an example of a combination of both sampling insufficiency and overindulgence. Pertaining to insufficiency, DOE has merely characterized the contamination as process waste without identifying the potential contaminants within the waste.

The Division understands that radionuclides are of concern, but why not solvents or metals? Pertaining to overindulgence, borings are proposed down drainage of the vault while soil gas surveys and surficial soil or sediment sampling is not proposed. Likewise, swipes of the vault interior may be appropriate within the initial stage of activity.

DOE must propose surficial soil sampling to verify HPGs and to investigate trace metals contamination unless DOE is able to show, through "process knowledge", that metals were not in the process waste.

When DOE provides a clearer and more complete discussion of potential contaminants of concern (COCs), then the Division can determine the adequacy of the FSP.

IHSS 135: DOE needs to justify the basis for the easterly limitation of the IHSS and explain why surficial soils/sediment sampling were not considered as a screening survey within the drainage.

IHSS 135, IHSS 137 and 138: What is the basis for the COCs for these IHSS's soil gas surveys? Since this is a cooling tower, what is the source of volatiles? The potential COCs of a volatile nature justifying the soil gas survey need to be discussed in Section 2.0.

IHSS 139.1(N),(S) and 139.2: Since these are caustic/acid spills what is the purpose of the soil gas surveys?

IHSS 144(N),(S): These IHSSs need to be subdivided in the table for clarity.

Section 2, page 2-54, second paragraph, notes that a ruptured line resulted in the "ground east of the building (Building 701)" being contaminated. Also, Table 5 of the IAG SOW required surficial soil sampling. Lastly, the "Suggested Modifications..." of this table states that "surface and shallow soil sampling have been added." Despite these indications, the proposal is that surficial soil samples "may" be added. There is an initial need for shallow soil sampling to determine the impact of the spill to the ground surface. Soil borings may also be warranted given the fact that IHSS 144(N) consists of four underground tanks. However, the proposal for eighteen soil borings appears to be overindulgent at this juncture of the investigation. Proposing extensive borings prior to conducting surficial sampling appears to

violate the staged approach discussed in Section 6.4.1. The Division will support borings at downgradient locations and, as needed, to fill informational gaps. Please reconsider the sampling needs and discuss, if necessary, with the Division and EPA.

IHSS 150.1: Given the nature of the release, shallow soil sampling would seem to be more appropriate, initially, with boring locations and frequency to be defined by a subsequent technical memorandum.

IHSS 150.2: The rationale for sixteen borings appears to be based on Table 5 of the IAG SOW and Well 1986. Although this well is technically downgradient from the IHSS, the need to drill boreholes at this stage appears to be unwarranted given the fact that this IHSS is based on a radioactive materials release. Shallow soil samples are needed but have not been proposed (despite what the modifications column suggests). The Division would look favorably upon two or three boreholes at the immediate downgradient boundary of the IHSS. As to the Table 5 requirement of twenty boreholes, they may be staged as needed under TM1. Under the "Soil Gas" Column, IHSS 144(N) is referred to twice while 144(S) is not referenced. The Division assumes that the latter reference should be for 144(S).

IHSS 150.3: Since this IHSS involves the potential contamination of shallow soils, borings, the Division agrees, may be warranted as an investigation activity. However, a grid is not necessarily the best approach. If information is available to target where the leak occurred, or at least the general area of the leak, the effort may be more successful. It is hoped that the HPGe and subsequent radiation screenings, as warranted, will help pinpoint favorable locations for borings which will then be proposed in TM 1.

IHSS 150.4, 150.6-150.8: Why are borings proposed at this time when contamination appears to be at the surface as a result of the 1969 fire in Building 776/777? Boreholes, as needed, should be proposed in TM1. The IAG SOW requires eight (not twelve) boreholes; however, given the history of this IHSS they can be delayed, if not eliminated.

IHSS 151: The proposed action under "Surface/Shallow Soils" i.e. "surface soil samples may be collected and analyzed for radionuclides contingent upon results from radiation surveys" is not appropriate. It appears that this proposed action was erroneously carried forward on the table. The Division agrees that a radiation survey is not warranted given that this IHSS is based upon a fuel oil leak.

Shallow soil samples should be proposed as a confirmation of and followup activity to the soil gas survey. Soil borings to bedrock may become necessary but the numbers and locations of the borings should be discussed in TM1.

IHSS 163.1: Since this IHSS is based upon a potential radionuclide release to the surface accompanied, possibly, by organic and inorganic compounds, surficial and depth profile sampling appears to be more appropriate as a staged activity than borings. Borings specified by the IAG SOW may be proposed, as needed, in TM1.

Soil gas analysis for TCE, PCE, etc. appears to be another carry forward error on the table. Table 5 of the IAG SOW does not specify PCE, TCE, etc.; apparently the potential compounds released are unknown. Consequently, noting "peaks for other compounds" is not sufficient. Any other peaks need to be identified by name.

The report of potential releases of inorganic compounds suggests the need for a full analysis suite not merely nitrates.

IHSS 163.2: Borings are proposed contingent on radiation survey results. With the concrete slab at a depth up to ten feet, the radiation survey would not be expected to define reliable borehole locations. What is needed is a reliable geophysical method of locating the slab.

Why is a soil gas survey proposed for this IHSS? Neither the Section 2 descriptions nor IAG SOW Table 5 supports the inclusion of a soil gas survey. If the Section 2.0 discussion has omitted information that supports the need for a soil gas survey, please revise the discussion to justify this proposed activity.

The column "Suggested Modifications..." states that "Surface/shallow soil sampling" has been added. The "Surface/shallow soil" column only commits to a "may be".

IHSS 173: This IHSS is based upon potential radionuclide releases to the surface; borings should be proposed, as necessary, in TM 1.

IHSS 184: It is unclear based on the historical descriptions of Section 2 why PCE, TCE and carbon tetrachloride, etc, are being targeted. Were these constituents on the parts that were cleaned? If not, why is a soil gas survey being performed?

Presuming sediments actually exist in the drainage of this IHSS, sediment samples are needed. If no actual stream

sediments were deposited, then, surficial soil sampling is needed. HPGe positives and negatives need to be confirmed.

The IAG SOW Table 5 has an additional requirement of investigating spillage identified from an August 6, 1971 aerial photograph. Please include in the FSP.

IHSS 188: The column "Suggested Modifications..." states that "Surface/shallow soil sampling" has been added. The "Surface/shallow soil" column only commits to a "may be".

The basis for this IHSS is an acid leak that may have contained heavy metals. Why then is a soil gas survey proposed? Also, borings are less appropriate given the nature of the release than surficial or shallow soils sampling. Borings, as needed, may be proposed in TM1.

Table 6.2: Table 5.8 specifies one additional borehole for the IHSS 150 sub-units; therefore, Table 6.2 should be amended for IHSSs 150.3, 150.6, 150.7 and 150.8 to add one borehole each.

The soil borings requirements do not correspond to IAG SOW Table 5 requirements. A clear statement should be made that a re-scoping has occurred as a result of HRR revised IHSS sizes and configurations and upon the Division's comments.

Figure 6-2: The index map color schemes of Figures 6-3 versus 6-9 and Figure 6-6 versus 6-7 are not distinguishable on this map.

Please label Building 701.

The line drawn from IHSS 150.7 to the index map is hidden by the Figure 6-10 boundary line. Please reposition.

Figure 6-8: Reference in the title to IHSS 144 should be 144(N).

Figure 6-9: This figure needs to be revised to show the narrow passage way that exists between Building 776/777 and 778.

Figure 7-1: DOE's submittal and EPA/Division approval of the Final Phase are not due on the same date. The EPA and the Division are currently scheduled to approve, or further comment on, the work plan by October 27, 1992.

Section 8.1.1: Reference to the Risk Assessment Guidance for Superfund, page 8-3, should now include Parts B and C, December 1991.

Section 8.1.2: In the first paragraph, please refer to the Final HRR.



In the third paragraph, DOE's future ecological land use plans are irrelevant, future onsite residents must be considered in the risk assessment.

Regarding the first paragraph, page 8-6, although it is acceptable to stage activities to determine the nature and extent of contamination of all media, it is not acceptable to assume that groundwater investigations may be delayed to a Phase II or to miss the Phase I Report schedule. Reasonable efforts must be made to meet the IAG schedules.

Section 8.3.5: External irradiation should be included in the last paragraph of this section to conform to Section 8.3.3.

Section 8.5: Regarding the third paragraph, page 8-20, DOE must look beyond IRIS and HEAST to EPA's Environmental Criteria Assessment Office (ECAO) for assistance in development of toxicity values. The latter step should be coordinated through the EPA Region VIII Rocky Flats Project group.

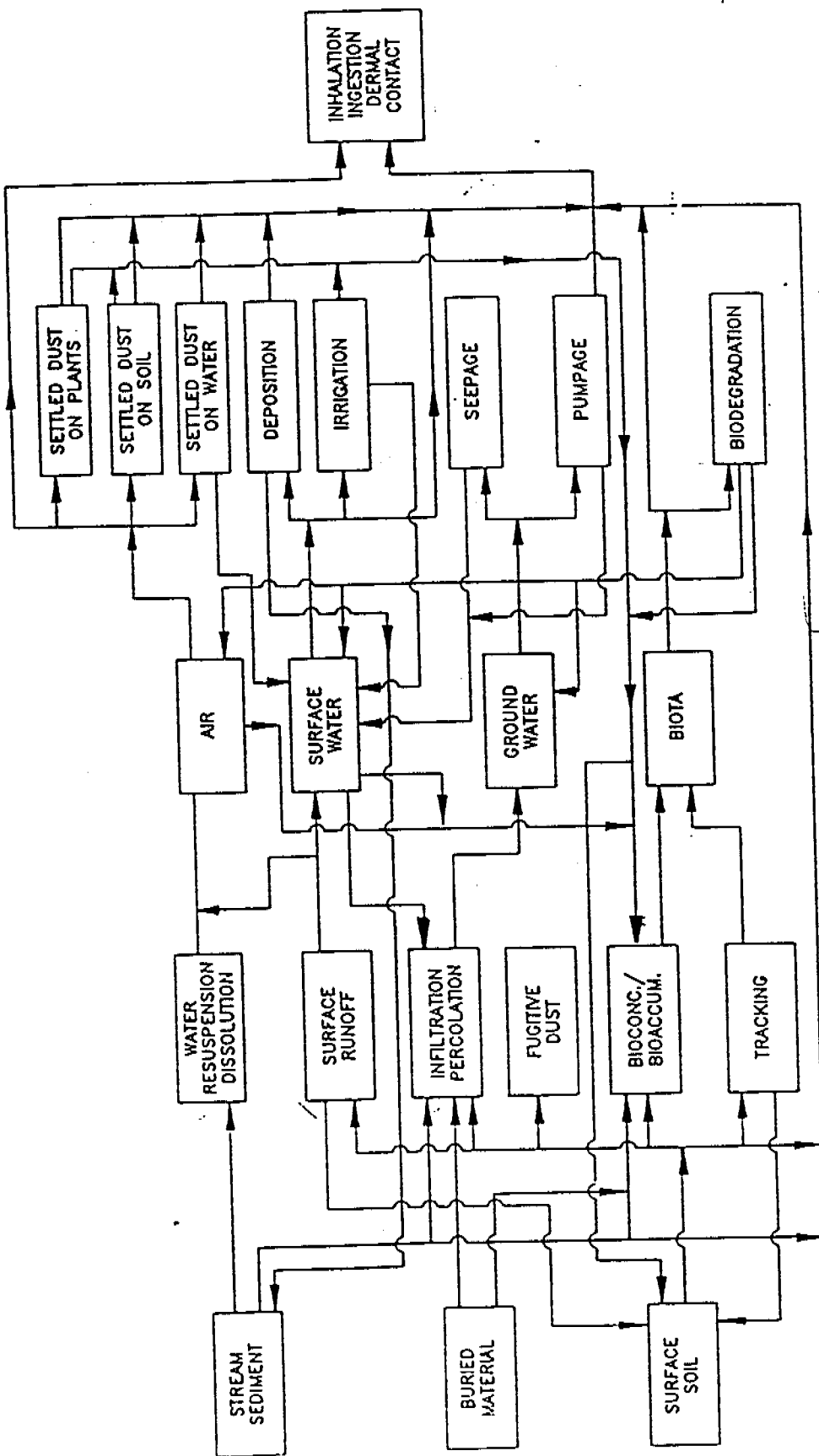
HUMAN  
EXPOSURE  
ROUTE

SECONDARY RELEASE  
MECHANISM

TRANSPORT  
MEDIUM

RELEASE  
MECHANISM

CONTAMINANT  
SOURCE



GENERAL CONCEPTUAL MODEL